



U.S. Department
of Transportation
Federal Highway

Administration

400 Seventh St., S.W.
Washington, D.C.
20590

Refer to: HSA-10/WZ-83

MR. PAUL LANG
LANG PRODUCTS INTERNATIONAL
1870 E. 50TH STREET
INVER GROVE HEIGHTS, MN 55077

Dear Mr. LANG:

Thank you for your letter of May 9 requesting Federal Highway Administration (FHWA) acceptance of your company’s Model 405-HD2 and 404-HD2 CrossWind™ portable sign stands as crashworthy traffic control devices for use in work zones on the National Highway System (NHS). Accompanying your letter was an analysis of the design of the stands referencing crash tests of similar stands made by your company. You requested that we find these CrossWind™ stands acceptable for use on the NHS under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 “Recommended Procedures for the Safety Performance Evaluation of Highway Features.”

Introduction

The FHWA guidance on crash testing of work zone traffic control devices is contained in two memoranda. The first, dated July 25, 1997, titled “INFORMATION: Identifying Acceptable Highway Safety Features,” established four categories of work zone devices: Category I devices were those lightweight devices which could be self-certified by the vendor, Category II devices were other lightweight devices which needed individual crash testing, Category III devices were barriers and other fixed or massive devices also needing crash testing, and Category IV devices were trailer mounted lighted signs, arrow panels, etc. The second guidance memorandum was issued on August 28, 1998, and is titled “INFORMATION: Crash Tested Work Zone Traffic Control Devices.” This later memorandum lists devices that are acceptable under Categories I, II, and III.

A brief description of the devices for which you are requesting acceptance follows:

The CrossWind™ series of portable sign stands for supporting (48 x 48-inch) rollup signs use identical components, sub-assemblies, and hardware. CrossWind™ model sign stand only vary in the length of the upright tubes and the lengths of the legs. Tube sizes and wall thicknesses are identical. The following matrix summarizes the CrossWind™ stands:

CrossWind™ Model	Length of Mast / Length of Legs	Mounting Height	FHWA Acceptance Letter
204-HD	660 mm (26 “)/ 1220 mm (48 “)	490 mm (19.3“)	WZ-37 dated 6-20-2000

606-EHD	1675 mm (66")/ 1830 mm (72 “)	1525 mm (60 “)	WZ-40 dated 6-6-2000
405-HD2	1220 mm (48")/ 1525 mm (60 “)	1015 mm (40 “)	WZ - 83 (This letter)
404-HD2	1220 mm (48")/ 1220 mm (48")	1015 mm (40 “)	WZ - 83 (This letter)

Testing

The CrossWind™ models 204-HD and 606-EHD were subjected to full-scale crash testing and were found acceptable. The only significant difference between those two stands and the two stands that are the subject of this action are the lengths of the mast and legs. The masts for the 405-HD2 and 404-HD2 are the same - they hold the bottom point of a 1220 mm - diamond roll-up sign at the base at a distance 1015 mm (40 inches) above the ground. This is an intermediate height that is normally considered very suspect for temporary sign stands. However, testing of the other two CrossWind™ models show that the roll-up sign detaches itself from the stand immediately after impact, ceasing to be a potential hazard. The mast is either pushed ahead by the vehicle and remains attached to the base, or separates and is knocked ahead.

Findings

Because of the similarity of the CrossWind™ models 405-HD2 and 404-HD2 to successfully crash tested stands we concur in your analysis that they should perform in an acceptable manner and will meet the FHWA requirements. Therefore, the devices described above and shown in the enclosed drawings for reference are acceptable for use as Test Level 3 devices on the NHS under the range of conditions tested, when proposed by a State.

You also requested that the CrossWind™ models 405-HD2 and 404-HD2 be considered acceptable when used with dual flag assemblies and/or with rectangular roll-up speed/distance panels mounted at appropriate elevations. Model 204-HD was successfully tested with the flag assemblies in place, and we consider that test to be the worst case scenario for the CrossWind™ product line. We concur that the speed/distance panels should have no adverse affect on the performance of these sign stands.

You also requested that we accept the “Basic 36” stand that is a smaller version of your “Basic 48” that was accepted in our letter WZ-37. The difference is that the legs are 915 mm (36 inches) long rather than 1220 mm (48 inches.) We concur in this request.

Please note the following standard provisions which apply to FHWA letters of acceptance:

- Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, nor conformity with the Manual on Uniform Traffic Control Devices.
- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.

- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that they will meet the crashworthiness requirements of FHWA and NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number WZ-83, shall not be reproduced except in full. This letter, and the test documentation upon which this letter is based, is public information. All such letters and documentation may be reviewed at our office upon request.
- Lang Products, International, devices may include patented components and if so are considered "proprietary." The use of proprietary work zone traffic control devices in Federal-aid projects is generally of a temporary nature. They are selected by the contractor for use as needed and removed upon completion of the project. Under such conditions they can be presumed to meet requirement "a" given below for the use of proprietary products on Federal-aid projects. On the other hand, if proprietary devices are specified for use on Federal-aid projects, except exempt, non-NHS projects, they: (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with existing highway facilities or that no equally suitable alternative exists or; (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.

Sincerely yours,

Frederick G. Wright, Jr.
Program Manager, Safety

2 Enclosures

Enclosure 1, Summary of Crash Tested Work Zone Traffic Control Devices, Lang Products International, Inc. WZ-37 - Updated for Acceptance Letter WZ-83

Device	Test	System	Orientation	Legs	Base (all are steel)	Mast	Horiz. Spreader	Flags
Basic 48 stand with WF48-SB sign	L-1	1	Head On	Rigid Steel 14 ga	465-mm steel support rigidly attached	Fiberglass 9.50 mm	Fiberglass 4.75 mm	None
CrossWind 204-HD with WF48-SB sign	L-1	2	Head On	Rigid Steel 14 ga	490-mm steel support pivotally attached	Fiberglass 9.50 mm	Fiberglass 4.75 mm	None
Basic 48 stand with WF48-SB sign & flags	L-2	3	Head On	Rigid Steel 14 ga	465-mm steel support rigidly attached	Fiberglass 9.50 mm	Fiberglass 4.75 mm	3.20 mm Fiberglass Staff
CrossWind 204-HD with WF48-SB sign & flags	L-2	4	Head On	Rigid Steel 14 ga	490-mm steel support pivotally attached	Fiberglass 9.50 mm	Fiberglass 4.75 mm	3.20 mm Fiberglass Staff
CrossWind 405-HD				Rigid Steel 14 ga	1220-mm steel support	Fiberglass 9.50 mm	Fiberglass 4.75 mm	3.20 mm Fiberglass Staff*
CrossWind 404-HD					1220-mm steel support			
Basic 36 stand					465-mm steel support			

NOTES to Enclosure 1. Please refer to the individual drawings for the details of each device.

SIGN: All sign panels were vinyl "roll-up" material. Details are on enclosed drawings.

LEGS: All legs are of square tubular steel. Rigid legs are 31.75 mm square.

MAST: "Fiberglass" is a flexible fiberglass piece approx. 31 mm wide, of thickness as noted.

FLAGS: Two 460-mm square vinyl flags on 1321-mm long fiberglass staffs, width as noted.

* The CrossWind 405-HD and 404-HD stands are also acceptable with a small square advisory plate roll-up sign placed below the diamond warning sign.

CROSSWIND™ 405-HD2



